







VISUAL DOCUMENT TESTING USING ROBOT FRAMEWORK

Many Kasiriha (DB Schenker)

IF YOU WANT

Repo for this Talk https://bit.ly/3BSew4M

GitPod URL

https://bit.ly/3SzZyXY

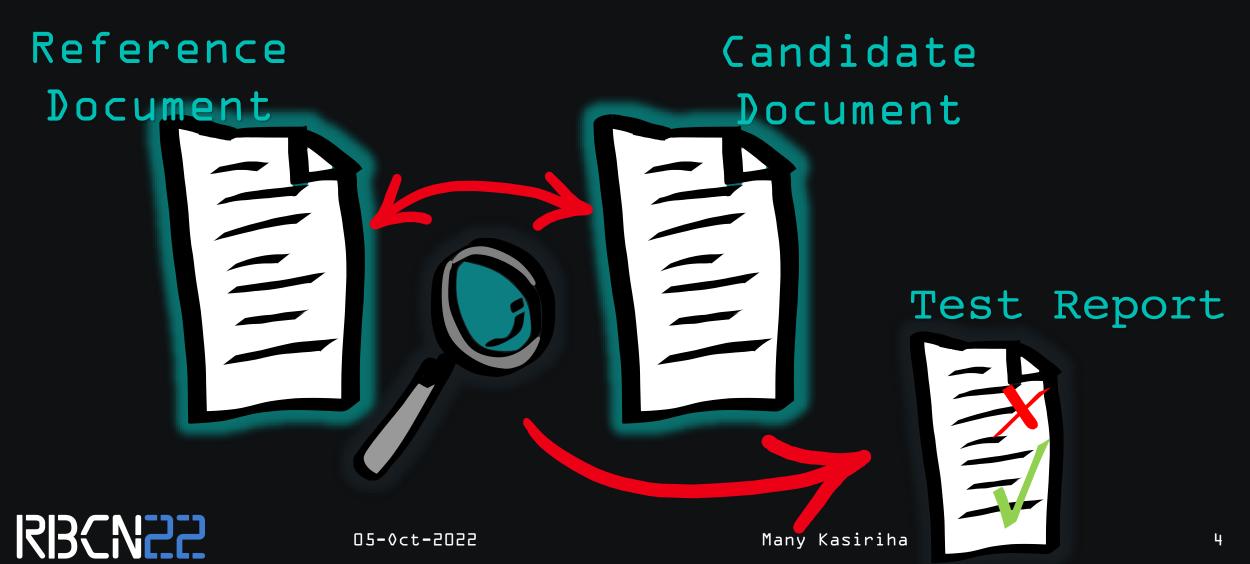
Repo of Document Testing Library

https://bit.ly/3LLCfs7





WHAT'S VISUAL DOCUMENT TESTING? - AND WHY DO I NEED IT?



IT'S LIKE FINDING THE DIFFERENCES IN TWO SIMILAR PICTURES...





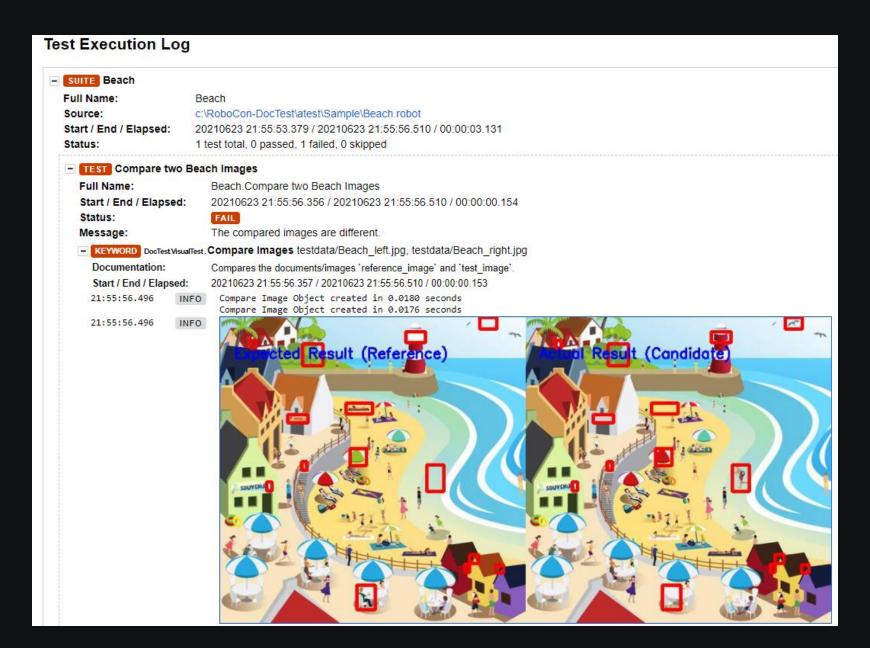
VISUAL COMPARISON

- -Compare two images or documents visually
- -Fails if different
- -Generates report with differences

```
*** Settings ***
Library DocTest.VisualTest

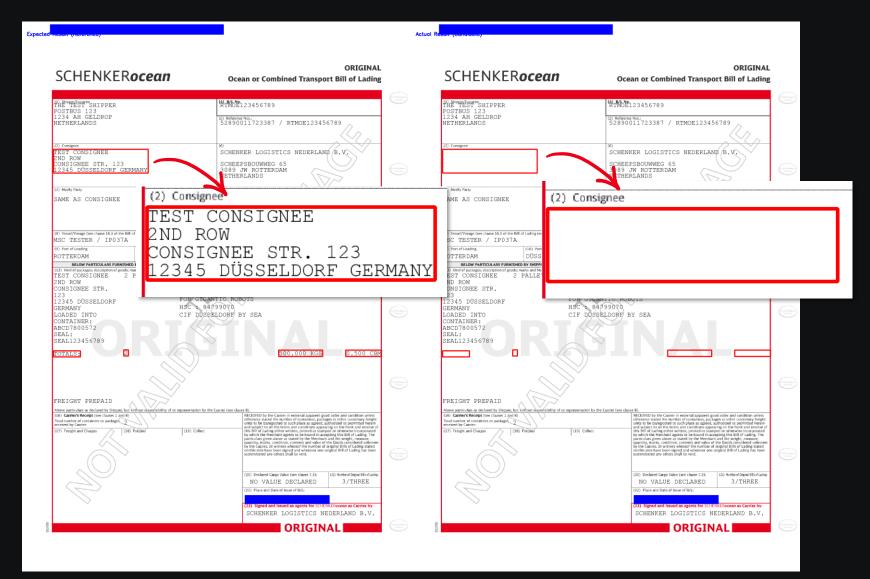
*** Test Cases ***
Compare two Beach images
    Compare Images Beach_left.jpg Beach_right.jpg
```







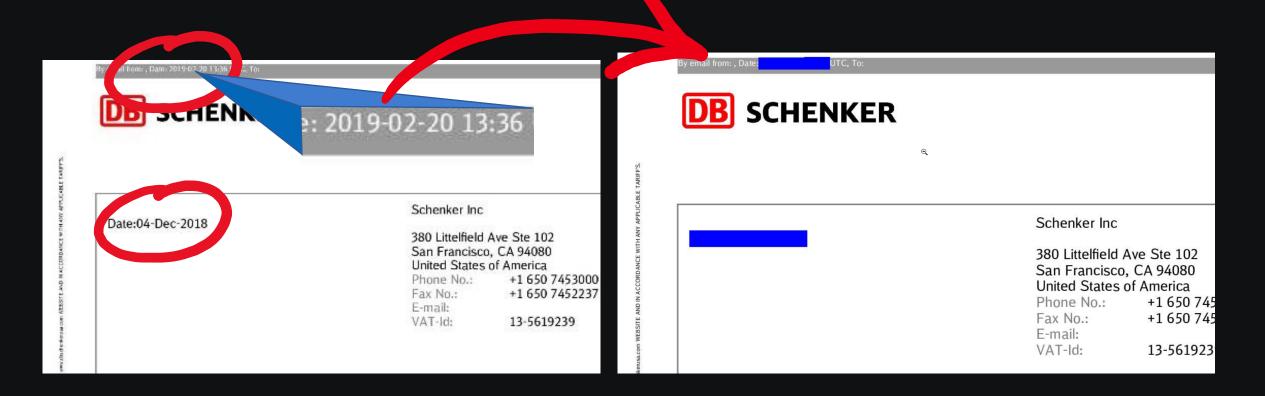
IN REALITY, IT'S MORE LIKE THIS





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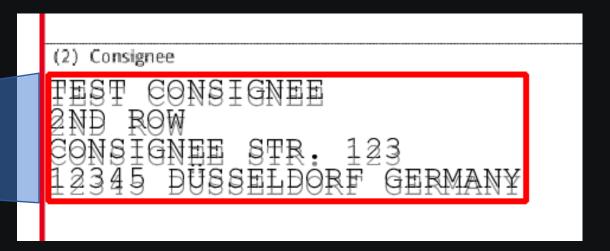
AND SOMETIMES THERE IS EVEN DYNAMIC DATA TO IGNORE





OR ACCEPTABLE SMALL DIFFERENCES





- Moved Textblock by max. 10 pixels?
- Same Text Content in changed area?



VISUAL DOCUMENT TESTING

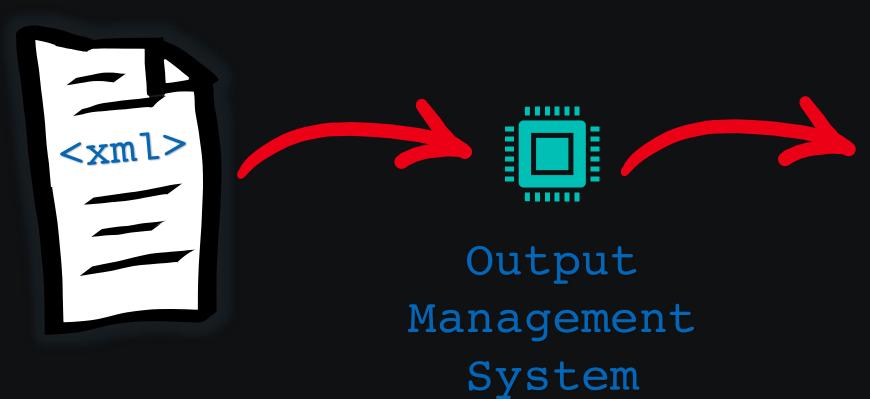
Let's Play
Examples: 01, 02, 03



Why?



OUTPUT MANAGEMENT SYSTEN - SIMPLIFIED

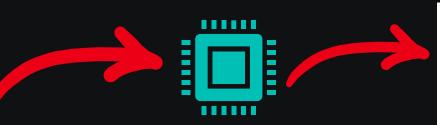




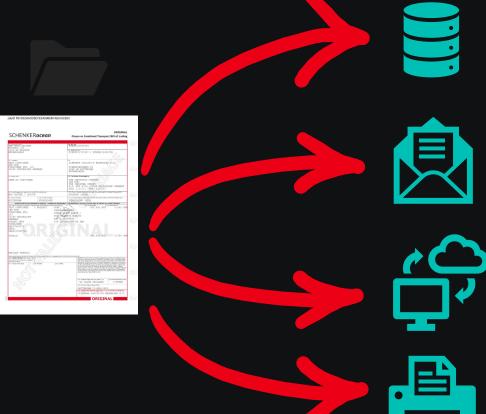


OUTPUT MANAGEMENT SYSTEM -A BIT MORE REALISTIC





Output
Management
System





Why Robot Framework? And why did we build a Library?



YOU NEED TO GET THE DOCUMENT BEFORE YOU CAN TEST IT



Retrieve Outputs from a Database



• Execute SQL statement and store Binary Object

Retrieve Outputs from Mailbox

·Access Office 365 Mailbox via Microsoft Graph API



Retrieve Outputs from Filesystem



· Connect to Server Filesystem via SSH

Retrieve Outputs from a Webservice

·Retrieve Output as response to a Webservice request



Retrieve Outputs from SMS

·Fake SMS by sending as eMail and retrieve from Mailbox

BUILD OR BUY ?

What we wanted

- -Small & Serverless
- -Extendable
- -Different Interfaces
- -Flexible ignoring of areas
- -Content Comparison
- -A VW Up! instead of a Maybach
- -Give something back to the Open Source Community



FEATURES VISUAL DOCUMENT TESTING

Different Filetypes

· Images, PDF, PCL,
Postscript

Visual (pixel wise) comparison of outputs

Use masks to ignore areas

· Coordinates, Text Patterns or Areas Reading and masking barcode content (not presented)

Compare text value for changed areas

Allow moved text blocks within a defined range

Remove Watermarks Test Report highlighting changed areas



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VISUALLY IDENTICAL = PRINTED IDENTICAL ?



- Trays (for each page)
- Duplex Printing
- Paper Types and Formats
- Binding
- •



PRINT JOBS -EXAMPLES

PCL File

```
\texttt{FSGE} \texttt{PSG} \texttt{\&u} \texttt{300D} \texttt{PSG} \texttt{\&l1S} \texttt{PSG} \texttt{\&t0P} \texttt{PSG} \texttt{\&l1HPSG} \texttt{\&l000E} \texttt{PSG} \texttt{\&l1XPSG} \texttt{*c14400x14400Y} \texttt{PSG} \texttt{*p0x0Y} \texttt{PSG} \texttt{*c0T} \texttt{PSG} \texttt{*0BIN};
SP1;
PU;
SC0,3.3867,0,3.3867,2;
TR0;
LA1,2;
LA2,1;
PW0;
PA-131,6000;
PD:
PR2480,0;
PR0,-3508;
PR-2480,0;
PR0,3508;
PU;
PM2;
```

Postscript File

```
/StrsPSOct10 50 dict dup begin
     /bd{bind def}bind def
     /ld{load def}bd
     /TR{translate}bd
     /M{moveto}bd
     /A{0 moveto}bd
     /RM{rmoveto}bd
26 /L{lineto}bd
     /RL{rlineto}bd
     /RT/rotate ld
     /LW{setlinewidth}bd
30 /ST{stroke}bd
31 /SD{1 eq {2 array astore 0 setdash}{[] 0 setdash}ifelse}bd
     /RCT{moveto exch dup 0 rlineto exch 0 exch rlineto neg 0 rlineto closepath}bd
     /XS/xshow ld
     /rgb/setrgbcolor ld
     /t/show ld
```



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FEATURES PDF CONTENT TESTING

Check Text in Document

·Single Strings or Lists

Compare Data between Documents

Text

Metadata

Fonts

Images

Signatures



FEATURES PRINT JOB TESTING

PCL and Postscript Files

Check single properties

Compare two print job files PCL

Paper Source

Copies

Duplex

Page Orientation

Page Format



FEATURES PRINT JOB TESTING

PCL and Postscript Files

Check single properties

Compare two print job files

Postscript

Comments

Pages

Features

Setup

Header

Trailer

PJL Commands



CONTENT AND PRINT JOB TESTING

Let's Play
Examples 04, 05



Mass Testing and Result Evaluation



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WHAT DO WE NEED FOR MASS TESTING?

- -Data Driver Library
- -Pabot
- -A tool to quickly evaluate results
- -Docker Image



```
*** Settings ***
Library DocTest.VisualTest DPI=${DPI}
                                           watermark file=${REFERENCE DIR}${/}watermarks
                                                                                           show diff=${true}
          DataDriver file=evaluator_sample.xlsx
Library
Test Template
                 Compare Documents
*** Variables ***
${REFERENCE_DIR} ${CURDIR}${/}..${/}testdata${/}image
${CANDIDATE_DIR} ${CURDIR}${/}..${/}testdata${/}candidate
${PAYLOAD_DIR} ${CURDIR}${/}..${/}testdata${/}payload
${MASK_DIR} ${CURDIR}${/}..${/}testdata${/}masks
${DPI}
         72
*** Test Cases ***
Create ${payload file}
```



TEST TEMPLATE

```
Compare Documents
    [Arguments]
                   ${reference image}
                                        ${payload file}
                   ${placeholder file} ${check text content}
                   ${move tolerance} ${contains barcodes}
                  ${get pdf content} ${DPI} ${retrieve output}
                  Copy Files for Failed Comparison
    [Teardown]
                   ${PAYLOAD DIR\$\{/\$\{payload file\}}
                                                       ${REFERENCE_DIR}${/}${reference_image}
                                                                                                   ${candidate file}
    IF
           $retrieve output == 'archive'
              Some logic to retrieve document after generation
        ${candidate file} Get Document From Somewhere
    END
    Compare Images
           reference image=${REFERENCE_DIR}${/}${reference_image}
           test_image=${candidate_file}
    . . .
           placeholder file=${placeholder file}
          check text content=${check text content}
          move tolerance=${move tolerance}
    . . .
           contains barcodes=${contains barcodes}
           get pdf content=${get pdf content}
          DPI=${DPI}
```



THE DATA SHEET

4	A	В	С	D	E	F	G	Н		
	*** Test Cases ***	\${reference_image}	\${payload_file}	\${placeholder_file}	\${check_text_content} *	\${move_tolerance} <	\${contains_barcodes} <	\${get_pdf_content} -	\${DPI}	
2	Create invoice.pdf from invoice.html with mask mask_	invoice.pdf	invoice.html	\${MASK_DIR}/mask_logo.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	archive
3	Create invoice.pdf from invoice_diff_date.html with m	invoice.pdf	invoice_diff_date.html	\${MASK_DIR}/mask_logo.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	archive
4	Create invoice.pdf from invoice_diffamounts.html wit	invoice.pdf	$invoice_diffamounts.html$	\${MASK_DIR}/mask_logo.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	archive
5	Create invoice.pdf from invoice_moved_text.html witl	invoice.pdf	invoice_moved_text.html	\${MASK_DIR}/mask_logo.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	archive
6	Create invoice.pdf from invoice_nologo.html with mas	invoice.pdf	invoice_nologo.html	\${MASK_DIR}/mask_logo.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	archive
7	Create invoice.pdf from invoice.html with mask mask_	invoice.pdf	invoice.html	\${MASK_DIR}/mask_invoice.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	archive
8	Create invoice.pdf from invoice_diff_date.html with m	invoice.pdf	invoice_diff_date.html	\${MASK_DIR}/mask_invoice.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	archive
9	Create invoice.pdf from invoice_diffamounts.html wit	invoice.pdf	$invoice_diffamounts.html$	\${MASK_DIR}/mask_invoice.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	archive
10	Create invoice.pdf from invoice_moved_text.html witl	invoice.pdf	invoice_moved_text.html	\${MASK_DIR}/mask_invoice.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	archive
11	Create invoice.pdf from invoice_nologo.html with mas	invoice.pdf	invoice_nologo.html	\${MASK_DIR}/mask_invoice.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	archive
12	Create invoice.pdf from invoice.html with mask mask_	invoice.pdf	invoice.html	\${MASK_DIR}/mask_logo.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	filesyste
13	Create invoice.pdf from invoice_diff_date.html with m	invoice.pdf	invoice_diff_date.html	\${MASK_DIR}/mask_logo.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	filesyste
14	Create invoice.pdf from invoice_diffamounts.html wit	invoice.pdf	$invoice_diffamounts.html$	\${MASK_DIR}/mask_logo.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	filesyste
15	Create invoice.pdf from invoice_moved_text.html witl	invoice.pdf	invoice_moved_text.html	\${MASK_DIR}/mask_logo.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	filesyste
16	Create invoice.pdf from invoice_nologo.html with mas	invoice.pdf	invoice_nologo.html	\${MASK_DIR}/mask_logo.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	filesyste
17	Create invoice.pdf from invoice.html with mask mask_	invoice.pdf	invoice.html	\${MASK_DIR}/mask_invoice.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	filesyste
18	Create invoice.pdf from invoice_diff_date.html with m	invoice.pdf	invoice_diff_date.html	\${MASK_DIR}/mask_invoice.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	filesyste
19	Create invoice.pdf from invoice_diffamounts.html wit	invoice.pdf	$invoice_diffamounts.html$	\${MASK_DIR}/mask_invoice.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	filesyste
20	Create invoice.pdf from invoice_moved_text.html witl	invoice.pdf	invoice_moved_text.html	\${MASK_DIR}/mask_invoice.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	filesyste
21	Create invoice.pdf from invoice_nologo.html with mas	invoice.pdf	invoice_nologo.html	\${MASK_DIR}/mask_invoice.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	filesyste
22	Create invoice.pdf from invoice.html with mask mask_	invoice.pdf	invoice.html	\${MASK_DIR}/mask_logo.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	email
23	Create invoice.pdf from invoice_diff_date.html with m	invoice.pdf	invoice_diff_date.html	\${MASK_DIR}/mask_logo.json	\${false}	\${None}	\${false}	\${false}	\${DPI}	email
					144		144			



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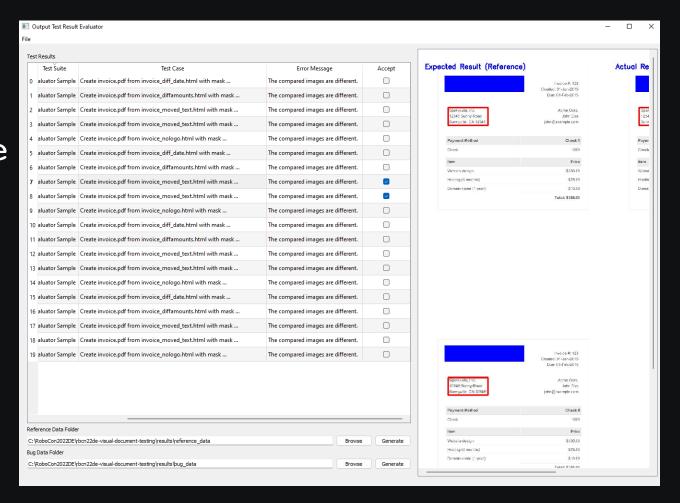
RUN TESTS WITH PABOT AND/OR DOCKER

```
# Some examples to run from project root
# Running with Pabot
pabot --testlevelsplit --processes 8 --artifacts png,jpg,pdf,xml --
artifactsinsubfolders tests/
# Running in a Docker Container (windows)
docker run -t -v "%cd%":/opt/test -w /opt/test robotframework-doctest robot
tests/
# Running in a Docker Container (linux)
docker run -t -v $PWD:/opt/test -w /opt/test robotframework-doctest robot tests/
```



OUTPUT TEST RESULT EVALUATOR

- -View screenshots
- -Filter & Sort
- -Accept Changes and generate new Reference data
- -Collect Data for Defect creation





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CONTENT AND PRINT JOB TESTING

Let's Play
Example evaluator sample







THANKS! QUESTIONS?

Many Kasiriha QA Engineer @ DB Schenker









KBCNSS